1.0.5 POLLUTANT STANDARDS

1.0.5.1 TRACEABILITY - Gaseous standards (permeation tubes, compressed gases, etc.) used to obtain test concentrations for CO, CH4, H2S, SO2, and NO2 are certified by comparison to a NIST gaseous Standard Reference Material (SRM). Test concentrations for ozone are referenced to an in-house NIST standard reference photometer. Test concentrations of VOC gases for the toxic audit program, NMHC audit program, and motor vehicle audit program are obtained from NIST gas cylinders.

Flow measurements are referenced to a primary NIST traceable volume or flow device.

Acid deposition audit samples are made by QA staff using samples from the latest U.S. EPA performance survey and tested against in-house NIST standards.

Meteorology Equipment Traceability: The rotation per minute of the motors is traceable by an internal integral optical encoder which provides direct read-out on the drive unit display. Pulse output from the optical encoder can be measured by a calibrated external frequency counter or data logger. The weights used on the torque disks are verified in calibrated scales. The thermistor temperature system is traceable to ASTM certified thermometers. The percent relative humidity capacitance sensor is traceable to humidity salt solutions standards. The psychrometer thermometers are traceable to ASTM certified thermometers. Torque watches are traceable by factory calibration. The rest of the met audit equipment do not have any traceability specifications.

1.0.5.2 RESPONSIBILITY - Within the ARB reporting organization, the PE&S Section provides certification of transfer or field standards.

1.0.5.3 HIERARCHY - The ARB maintains a hierarchy of standards depending on their intended use. Table 1.0.5.1 summarizes hierarchy and usage of gaseous pollutants, ozone, and flow standards. Acid rain samples are bought from NIST. The dry acid deposition also uses the stated flow standards.

1.0.5.4 CERTIFICATION CRITERIA - Each standard shall meet ARB certification criteria. These criteria are based on several factors, including long term stability, reliability, use, and practicality of recertification.

For compressed gases, the three most recent assays must have a relative standard deviation [(standard deviation / mean) x 100 percent] of less than 1 percent for ambient concentration cylinders and less than 1.5 percent for high concentration cylinders that must be diluted (applies to criteria pollutants).

For flow transfer standards, the relative standard deviation for the slope must be less than 1 percent and the intercept divided by full scale reading x 100 percent must be less than 1 percent for the last four calibrations.

For ozone transfer standards, the standard deviation for the slope must be less than 0.015 and the intercept standard deviation must be less than 0.005 for the last six calibrations.

TABLE 1.0.5.1
TYPES AND HIERARCHY OF CRITERIA/TOXIC POLLUTANT STANDARDS

TYPE:	**COMPRESSED GAS**	**OZONE**	**FLOW**
HIERARCHY:			
PRIMARY	**NIST - SRM**	**NIST REFERENCE PHOTOMETER**	**BROOKS METER / ROOTS METER**
USE:	CERTIFICATION OF LABORATORY STANDARDS	CERTIFICATION OF OZONE TRANSFER STANDARDS	CERTIFICATION OF ORIFICES, MASS FLOW METERS AND CONTROLLERS
SECONDARY	**LABORATORY STANDARD**	**TRANSFER STANDARD**	**ORIFICE MASS FLOW METER AND CONTROLLER**
USE:	CERTIFICATION OF WORKING STANDARDS	INSTRUMENT CALIBRATION, INSTRUMENT AUDITS	INSTRUMENT CALIBRATION, INSTRUMENT AUDITS, COMPRESSED GAS ASSAY
TERTIARY	**WORKING STANDARD**	**NONE**	**ROTAMETER**
USE:	INSTRUMENT CALIBRATION, INSTRUMENT AUDITS, INSTRUMENT PRECISION		FLOW CHARTS FLOW INDICATION

NOTE: The primary gas standard for SO2 is an NIST-SRM permeation device. All other SO2 standards are compressed gas standards. H2S is converted to SO2 and is traceable through an SO2 NIST-SRM permeation device. All compressed gases and rain sample standards (acid deposition) come from NIST and U.S. EPA.